Conservation Biology (EBIO323/ENST323)
Syllabus Fall 2014
Duncan College 113

Instructor
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Office Hours: by appointment – please email to me to arrange a time!

Graduate Teaching Assistant
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Office: Anderson Biology 103c
Office hours: TBA before assignments and exams and by appointment.

Meeting Times
LECTURE: Tuesday and Thursday 01:00pm-02:15 PM
One class field trip outside of regular meeting time: TBA

Course Materials
We will be using the free, online textbook: *Conservation Biology for All*. eds. Sodhi, Navjot S., and Paul R. Ehrlich. Oxford University Press, 2010.
The link to download the text is: http://www.conbio.org/publications/free-textbook

Other readings will be available as PDF files placed on the course website in Owlspace.

Web Site
We will use Owlspace for assignments, schedules, announcements, etc. Powerpoint lectures will likely be posted to the website the day after they are given. This allows me to make last minute updates and changes as needed and allows more flexibility in materials covered depending on the direction of class discussion.

Course objectives
Students that have completed the course will possess:

1. An understanding of the difference between conservation biology and other ecological disciplines.
2. The ability to recall patterns of biodiversity including its many hierarchical levels.
3. Knowledge concerning the principle threats to biodiversity.
4. A basic understanding of the methods, tools, and approaches currently utilized to conserve biological diversity.
5. The ability to describe both successful and unsuccessful case studies of conservation efforts and discern characteristics of each.
6. A familiarity with the current issues, controversies and dilemmas within the field of conservation biology.
7. An opportunity to apply what is learned in class to a real-world, local conservation project that will directly affect the Rice community.

Grading
Grades will generally be distributed as follows (any curving will not be "against you"):
≥90% A 80-89% B 70-79% C 60-69% D ≤59% F

Course component	Max points	% grade
Prairie team project	195 (total points)	48.75
2 mini-reports	40 (20 each)	10 (5 each)
Final written report	50	12.5
Final oral report	55	13.75
Synthesis	20	5
Final class presentation	20 (attendance)	5
Peer evaluation	10	2.5
Biodiversity presentation	20	5
PVA assignment	20	5
Genetics assignment	20	5
Quizzes	15	3.75
Field trip or Seminar	5	1.25
Exams 1 & 2	120 (60 each)	30 (15 each)
Total	400	100%

Extra credit
Approved seminar attendance and 1 page summary
Max points = 4 (1% of total course grade)

Approved seminars may include (but are not limited to) Rice EEB seminar series lectures, conservation-related lectures at the Houston Zoo or the Museum of Natural Science, Native Plant Society meetings, or other local conservation non-profits. I will be providing information on upcoming lectures throughout the semester. If you find a seminar that is applicable to class but is not on the approved list, please check with me in advance.

Late policy:
The majority of assignments will be due at noon (before class on the day they are due) on Owlspace. For each day the assignment is late, 20% will be taken off. If you have an issue with the assignments or the due date, please contact the instructor *before the assignment is due* with questions and concerns!

All students are expected to follow the Rice Honor Code.

Any student with a disability that requires accommodation is encouraged to contact both the course instructor and Disability Support Services in the Allen Center.

Course Details:

Lecture Exams (60 points each): You will have two course exams; a midterm and a non-cumulative final exam. Note that the second exam will not occur during the week of finals. Topics covered in the lecture period, by guest speakers, and in the assigned readings for discussion will be fair game. Format will be mixed and may include: matching, fill- in, multiple choice, short answer, and essay. Be prepared to synthesize ideas. Students will be allowed to submit questions for possible use on the exams.

Pocket prairie team project (195 points total): This semester as a student in Conservation Biology, you will have the unique opportunity to participate in an actual conservation project on campus! The coastal prairie is one of the most endangered ecosystems in the United States. The greater Houston area was once part of a coastal prairie ecoregion of which less than 1% remains. As part of an initiative to save this critically endangered ecosystem, local conservation groups are encouraging the planting of urban pocket prairies. Rice University wants to join these conservation efforts and the Fall 2014 Conservation Biology class is going to spearhead this project forward.

Because of the multidisciplinary nature of conservation biology, this project is going to take place in a team setting. Each team will be responsible for designing a proposal for Rice University's pocket prairie. The proposals will be developed over the course of the semester using information learned in lectures, as well as from expert guest speakers. During the course of the semester two mini-reports (20 pts each) will be submitted for review to give teams an opportunity to develop their ideas and to stay on track writing the proposal. Two class periods will be set aside to allow time to work on the proposals. Experts in prairie restoration will be attending this classes to offer advice on proposals, so this is NOT an opportunity to skip class (there may also be "incentives" to come to class on these days – hint, hint).

Though there is a standard outline for the written proposals (see below), I expect (and hope) that each group will develop distinct ideas for the direction and purpose of the prairie. A final written report (50 pts) and a final group proposal presentation (55 pts) will be due at the end of the semester. A portion of this grade will also be derived from a peer evaluation (10 pts). During the final week of the course, the class will either synthesize the presented project ideas or will vote on the best proposal (20 pts). A final class proposal will be presented to Rice's arboretum committee and a panel of prairie restoration experts on the day of the final exam. All students are expected to attend to be able to field questions and explain the project to the panel (20 pts). This is a fantastic opportunity to not only learn how real conservation efforts take place, but to make a positive environmental impact on campus.

Special note to students with medical school interviews in the fall!!

I am well aware that medical school interviews will be taking place around the same time as our final presentations. I will be assigning a date for each group's presentations in September; therefore, you must let me know ASAP if your interviews will be in conflict with one of the presentation dates so we can both plan accordingly.

If you miss your group's presentation: You will be given a 0 for that assignment UNLESS you do the following: Get a written letter of consent from your group stating

that you contributed to the design of the presentation AND you take part in an extra-curricular assignment (i.e.; volunteer in an activity of my choosing, an independently researched topic that will be presented to the class, or other similar activity). These activities will not be easy, so if you have questions, PLEASE come talk to me early about your interview schedule!

Biodiversity Presentation (20 pts): Students will work in groups of 4. Each group will be assigned a specific threat to biodiversity to carefully research. Groups will then give a 10-minute (max) presentation to the class on the subject. The material presented by each group will be included in Exam 1 (so take notes). PowerPoint presentations need to be delivered to instructor, or uploaded to Owlspace, before class the day the presentations are due.

Population Viability Analysis assignment (20 pts): Students will be assigned the review article, *Emerging Issues in Population Viability Analysis* by Reed et al (2001). Students may work in pairs to write up a 1-page essay on the pros and cons of using PVA for conservation. Each student must come to class prepared on 10/7 to discuss the issues that surround PVA (participation will be a component of the overall grade).

Conservation Genetics Assignment (20 pts): Prairie groups will identify a primary journal article that uses molecular or genetic tools for conservation. Each group will write a 1-page summary of the article with one paragraph summarizing the work in the paper and the second paragraph summarizing a key figure in the paper (10 pts). Each group will give a 5-minute presentation on this figure and the genetic or molecular method used to collect the data (10 pts).

Quizzes (15 pts total): There will be a series of "random" quizzes given throughout the semester at the instructor's discretion. These quizzes may cover lecture material, information provided by invited speakers, or be related to the ongoing prairie project.

Field trip/Lecture seminar attendance (5 pts): As part of the class, we will be visiting the Houston Zoo's Houston toad *ex situ* program facility. This field trip will take place outside the regularly scheduled class, most likely on the weekend (date TBA). If you cannot make it to the field trip, you may substitute a relevant scientific or conservation-based seminar. If you choose to attend a seminar, you must also write a 2-paragraph summary of the seminar. Please include the name of the presenter, date, location of seminar, and the presentation title in your summary and turn it in within 2 weeks of attending the seminar. There is no write up required for the visit to the zoo.

Extra Credit (4 pts): For extra credit you many attend a scientific seminar relevant to conservation biology and write up a 1-page summary (notice that this is longer than the seminar write up that is mandatory for the class). Please include the name of the presenter, date, location of seminar, and the presentation title in your summary and turn it in within 2 weeks of attending the seminar. I will be announcing relevant seminars throughout the semester; however, if you find a seminar on your own, please make sure to okay it with me in advance.

Topics covered (subject to change!):

1) Introduction
    a. What is conservation biology?
    b. Brief history of conservation biology
2) Biodiversity
    a. What is biodiversity and why is it important?
    b. How is biodiversity measured and quantified?
    c. Threats
    d. ecosystem services (and we are the 2%!)
3) Habitat loss and fragmentation
    a. Causes and significance
    b. Edge effects
    c. Influence to biodiversity
4) Invasive species
    a. Good/bad/negligible? What makes invasive species invasive?
    b. Local examples
5) Climate change
    a. Overview of climate change theory
    b. Recent anthropogenic influences on climate
    c. Controversies
6) Extinction
    a. Review of Earth's major extinction events
    b. Current trends in extinction (6^{th} extinction)
    c. Case study – amphibian declines
7) Ecological tools and techniques
    a. Landscape level analysis
        i. Analysis of populations/Habitat suitability
        ii. Source/sink populations
        iii. Metapopulations
    b. Population/species level
        i. Minimum viable population
        ii. Population viability analysis
8) Conservation genetics
    a. Speciation, genetic variation and gene flow
    b. Genetic and molecular tools used for conservation
9) Conservation planning and policy
    a. Reserves/Corridors
    b. SLOSS debate
    c. Planning for climate change
    d. Brief overview of national/state policies on conservation
10) Conservation genetics
    a. Speciation, genetic variation and gene flow
    b. Genetic and molecular tools used for conservation
11) *In situ* vs *Ex situ* conservation
    a. Role of zoos and aquariums in conservation (include genetic management)
    b. Pros/cons compared to *in situ* methods
    c. Case study – Houston Zoo's Houston toad program
12) Urban and local conservation
    a. The emerging role of municipalities in conservation
    b. Challenges
    c. Texas and Houston conservation efforts
13) Current topics in conservation

Course Schedule (subject to change!)

Date	Topic	Assignments due
8/26/13	Course introduction and history	
8/28/13	Biodiversity	
9/2/13	Biodiversity cont., How to read a scientific paper	
9/4/13	Presentations on biodiversity threats	10 minute group presentation
9/9/13	Ecosystem services	
9/11/13	Guest speaker - Jamie Gonzales, Katy Prairie Conservancy	
9/16/13	Habitat loss and fragmentation	
9/18/13	Prairie project work day: site visit	
9/23/13	Invasive species	
9/25/13	Climate change	Mini report 1 due @ 11AM
9/30/13	Extinction	
10/2/13	Ecological tools and techniques	
10/7/13	Ecological tools cont., PVA class discussion	Short paper on PVA due @ 11AM
10/9/13	Exam 1	
10/14/13	FALL BREAK	
10/16/13	Guest speaker - Nicholas Butler, Memorial Park Conservancy	
10/21/13	Prairie project workday	
10/23/13	Conservation genetics	
10/28/13	Conservation genetics, continued	Conservation genetics due @ 11AM
10/30/13	Conservation planning and policy	Mini report 2 due @ 11AM
11/4/13	*In situ* vs *Ex situ* conservation	
11/6/13	Guest speaker - Jeff Hill, USFWS	
11/11/13	Urban and local conservation	
11/13/13	Current topics in conservation	
11/18/13	Exam 2	
11/20/13	Controversies, everyday conservation	
11/25/13	Prairie project presentations	Final papers due @ noon for all; peer evals
11/27/13	THANKSGIVING	
12/2/13	Prairie project presentations	Peer evals
12/4/13	Synthesis for prairie project	Pro/con analysis, attendance grade
TBA	FINAL PRAIRIE PRESENTATION	Attendance grade